STATUS OF THE CLAIMS

1. (Currently amended) A microfluidic device for fiber optic interrogation of multiple samples, the microfluidic device comprising:

a substrate having a surface, the surface defining a plane, the substrate integrally comprising a multiplicity~~plurality~~ of optic fibers having substantially parallel axes that are essentially perpendicular to the plane of the substrate; and

a layer formed on the surface of the substrate, the layer defining at least one topological feature, wherein the topological feature communicates with at least one optic fiber for interrogation of a sample.

2. (Original) The microfluidic device of claim 1, wherein the substrate is further integrally comprising clad glass.

3. (Original) The microfluidic device of claim 1, wherein at least one optic fiber comprises a region of core glass.

4. (Original) The microfluidic device of claim 1, wherein the topological feature of the microfluidic device comprises a well.

5. (Original) The microfluidic device of claim 1, wherein the topological feature of the microfluidic device comprises a channel.

6. (Currently amended) The microfluidic device of claim 4~~ or 5~~, wherein the microfluidic device comprises a plurality of

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topological features, the plurality of topological features comprising wells, channels or a combination thereof.

7. (Original) The microfluidic device of claim 6, wherein the plurality of topological features comprises a patterned array.

8. (Original) The microfluidic device of claim 1, wherein the layer formed on the surface of the substrate comprises a photoresist material.

9. (Original) The microfluidic device of claim 8, wherein the photoresist material comprises a polymeric resin.

10. (Original) The microfluidic device of claim 9, wherein the polymeric resin is cross-linked.

11. (Original) The microfluidic device of claim 1, wherein the layer formed on the surface of the substrate has a thickness less than about 1000 mm.

12. (Original) The microfluidic device of claim 1, wherein the layer formed on the surface of the substrate has a thickness less than about 250 µm.

13. (Original) The microfluidic device of claim 6, wherein a diameter of at least one well is less than about 10 mm.

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14. (Original) The microfluidic device of claim 1, wherein at least one optic fiber is associated with at least one charged coupled device for interrogation of the sample.

15. (Original) The microfluidic device of claim 1, wherein the sample is associated with a biological, a chemical or a physical event.

16. (Original) The microfluidic device of claim 1, wherein the microfluidic device further comprises a second layer formed on the layer.

17. (Original) The microfluidic device of claim 16, wherein the second layer defines at least one topological feature.

18. (Original) The microfluidic device of claim 16, wherein the second layer forms a network operable for the interrogation of a sample fluid.

19. (Original) The microfluidic device of claim 1, wherein the layer comprises a label, the label integral with the layer for identification of the microfluidic device.

20. (Currently amended) A method of fabricating a microfluidic device for fiber optic interrogation of multiple samples, the method comprising:

providing a substrate having a surface and defining a plane, the substrate integrally comprising a multiplicity ~~plurality~~ of

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optic fibers having substantially parallel axes that are essentially perpendicular to the plane of the substrate; and

depositing a layer on the surface of the substrate, the layer defining at least one topological feature, wherein the topological feature communicates with at least one optic fiber for interrogation of a sample.

21. (Original) The method of claim 20, wherein the method further comprises selectively curing a portion of the layer.

22. (Original) The method of claim 21, wherein the portion of the layer is selectively cured by exposure to light through an opening in a photomask.

23. (Original) The method of claim 21, wherein the method further comprises removing an uncured portion of the layer.

24. (Original) The method of claim 22, wherein the uncured portion of the layer is removed by a solution comprising a solvent.

25. (Original) The method of claim 20, wherein the layer is deposited on the surface of the substrate by a spin-on process.

26. (Original) The method of claim 20, wherein the method further comprises depositing a second layer on the layer.

27. (Original) The method of claim 26, wherein the second layer defines at least one topological feature.

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28. (Original) The method of claim 26, wherein the second layer forms a network operably for interrogation of a sample fluid.

29. (Original) A method for fiber optic interrogation of multiple samples in parallel, the method comprising:

providing the microfluidic device of claim 1; and

contacting the layer with a sample, wherein the sample is partially contained by at least one topological feature.

30. (Original) The method of claim 29, wherein the method further comprises interrogating the sample or an event associated therewith, and further wherein interrogation is performed by at least one optic fiber.

31. (Original) The method of claim 29, wherein the layer is contacted by a plurality of samples, wherein each sample is partially contained by at least one topological feature.

32. (Original) The method of claim 31, wherein the method further comprises simultaneously interrogating the plurality of samples or an event associated with each sample, and further wherein simultaneous interrogation is performed by at least two optic fibers.

33. (Currently amended) The method of claim 30~~ or 32~~, wherein at least one event is a biological, a chemical or a physical event.

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34. (Currently amended) The method of claim 30~~ or 32~~, wherein at least one optic fiber is operably associated with at least one charged coupled device.

35. (Original) The method of claim 34, wherein the charged coupled device receives a data from at least one optic fiber.

36. (Original) The method of claim 35, wherein the data received from at least one optic fiber is associated with at least one sample or event.

37. (Original) A microfluidic device for interrogation or analysis of multiple samples, the microfluidic device comprising:

a substrate having a surface, the substrate integrally comprising a plurality of diagnostic elements; and

a layer formed on the surface of the substrate, the layer defining at least one topological feature, wherein the topological feature communicates with at least one diagnostic element for interrogation or analysis of a sample.

38. (Original) The microfluidic device of claim 37, wherein the topological feature for the microfluidic device comprises a well.

39. (Original) The microfluidic device of claim 37, wherein the topological feature for the microfluidic device comprises a channel.

40. (Currently amended) The microfluidic device of claim 38~~ or 39~~, wherein the microfluidic device comprises a plurality of

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topological features, the plurality of topological features comprising wells, channels or a combination thereof.

41. (Original) The microfluidic device of claim 40, wherein the plurality of topological features comprises a patterned array.

42. (Original) The microfluidic device of claim 37, wherein the layer formed on the surface of the substrate comprises a photoresist material.

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